

## Section 2.1 - Solving 1 Step Equations

SOLVE  
EQUATIONS:

- WE ISOLATE THE VARIABLE
- GET THE VARIABLE WITH A COEFFICIENT OF 1 ONE ALONE ON ONE SIDE OF THE EQUATION

INVERSE  
OPERATIONS:

OPERATIONS THAT UNDO  
OTHER OPERATIONS

$$+ \rightarrow - + \quad * \div \quad \div *$$

ADDITION OR  
SUBTRACTION

$$\begin{array}{r} 1. \quad x + 63 = 92 \\ \quad -63 \quad -63 \\ \hline x = 29 \end{array}$$

$$\begin{array}{r} 29 + 63 = 92 \\ \checkmark 92 = 92 \end{array}$$

$$\begin{array}{r} 2. \quad -17 = k + 4 \\ \quad -4 \quad -4 \\ \hline -21 = k \end{array}$$

$$\begin{array}{r} -17 = -21 + 4 \\ -17 = -17 \end{array}$$

$$\begin{array}{r} 3. \quad 20 = y - 8 \\ \quad +8 \quad +8 \\ \hline 28 = y \end{array}$$

## Section 2.1 - Solving 1-Step Equations

Evaluation  
vs. Solving:

$$\frac{8-4^2}{15 \div 5}$$

$$x+3=8$$

Solving  
Equations:

- One-Step  $x+3=8$
  - Two-Step  $2x+4=16$
  - Multi-Step  $3(x-4)+16=87$
  - Variables on both sides  $3x-2=4x+1$
  - Quadratics  $x^2-4x+3=0$
  - Systems of Equations
- $$\begin{cases} y=x+3 \\ y=2x-1 \end{cases}$$

Goal in Solving:

ISOLATE THE VARIABLE  
(GET IT ALONE ON ONE  
SIDE OF EQUATION)

COEFFICIENT OF 1

USE INVERSE OPERATIONS TO  
'UNDO' OTHER  
OPERATIONS

$$+- \quad -+ \quad *\div \quad \div*$$

## Section 2.1 - Solving 1-Step Equations

The Golden Rule:

What we do to one side of the equation.....

WE DO TO THE OTHER

Addition or Subtraction:

$$\begin{array}{r} 1. \quad x + 63 = 92 \\ \quad \quad -63 \quad -63 \\ \hline x = 29 \end{array}$$

$$\begin{array}{r} 29 + 63 = 92 \\ \checkmark 92 = 92 \end{array}$$

$$\begin{array}{r} 2. \quad -17 = k + 4 \\ \quad \quad -4 \quad -4 \\ \hline -21 = k \end{array}$$

$$-17 = -21 + 4$$

$$\checkmark -17 = -17$$

$$\begin{array}{r} 3. \quad 20 = y - 8 \\ \quad \quad +8 \quad +8 \\ \hline 28 = y \end{array}$$

$$y = 28$$

## Section 2.1 - Solving 1-Step Equations

Multiplication  
or Division:

$$4. \quad \frac{3x}{3} = \frac{-42}{3} \quad 3(-14) = -42$$

$$1x = -14 \quad \checkmark -42 = -42$$

$$-7\left(\frac{x}{-7}\right) = (2) \cdot (-7) \quad \frac{-14}{-7} = 2$$

$$1x = -14 \quad \checkmark 2 = 2$$

$$x = -14$$

You Try:

$$\frac{-5x}{-5} = \frac{20}{-5}$$

$$x = -4$$

$$\frac{8k}{8} = \frac{-32}{8}$$

$$k = -4$$

$$\frac{x}{3} = 5 \quad -3 \cdot \left(\frac{y}{-3}\right) = (10) \cdot -3$$

$$\frac{x}{\cdot 3} = \frac{15}{\cdot 3} \quad \frac{y}{\cdot -3} = \frac{-30}{\cdot -3}$$

$$x = 15 \quad y = -30$$

Summary:

To solve equations, you isolate the variable. We do this by getting the variable with a coefficient of 1 alone on one side of the equation. To isolate the variable, we use inverse operations to 'undo' other operations.

We can check our solution by plugging it into the original equation and checking to see if the equation is 'true.'

Although we can do simple equations with mental math, we need to understand the process to do more complicated problems.